

**CLAIM AMENDMENTS:**

1. (Original) An in-line four-cylinder engine for a vehicle including a crankshaft having first crank pins of two cylinders, wherein the first crank pins are provided on a common first virtual plane and are arranged with a  $180^\circ$  phase difference, and having second crank pins of another two cylinders, wherein the second crank pins are provided on a second virtual plane different by a  $90^\circ$  phase from the first virtual plane and are arranged with a  $180^\circ$  phase difference, the in-line four-cylinder engine comprising:

a crankshaft satisfying a formula of  $(k_L - 0.25)(0.25 - k_R) \cong D_R/D_L$ ,

wherein, when a crank web for each of at least two cylinders is divided between a pair of half crank webs facing a crank pin,

wherein  $k_L, k_R$  denote balance ratios of the both half crank webs (wherein  $k_L \neq 0.25$ ,  $k_R \neq 0.25$ ) and

$D_L, D_R$  denote distances from the center in a longitudinal direction of the crankshaft to the respective half crank webs, the crank webs for the four cylinders of the engine are set so that a track of a vector of a primary inertial couple is formed into a substantially circular shape; and

a primary balancer for generating a couple vector offsetting a vector of the first inertia couple.

2. (Original) The in-line four-cylinder engine for a vehicle according to claim 1, wherein  $(k_L + k_R)$  for at least a part of the cylinders is less than 0.5.

3. (Original) The in-line four-cylinder engine for a vehicle according to claim 1, wherein  $(k_L+k_R)$  for at least a part of the cylinders is more than 0.5.

4. (Original) The in-line four-cylinder engine for a vehicle according to claim 1, wherein two cylinders satisfy a condition in claim 1 and both of the balance ratios  $k_L$  and  $k_R$  of the other two cylinders are set at 0.25.

5. (Previously Presented) The in-line four-cylinder engine for a vehicle according to any one of claims 1 to 3, wherein the crankshaft has crank pins of the first and fourth cylinders located on the first virtual plane, and crank pins of the second and third cylinders located on the second virtual plane, when the first to fourth cylinders are provided in this order from an end.

6. (Previously Presented) The in-line four-cylinder engine for a vehicle according to claim 1, wherein the crankshaft has crank pins of the first and third cylinders located on the first virtual plane, and crank pins of the second and fourth cylinders located on the second virtual plane.

7. (Previously Presented) The in-line four-cylinder engine for a vehicle according to claim 1, wherein the crankshaft has crank pins of the first and second cylinders located on

the first virtual plane, and crank pins of the third and fourth cylinders located on the second virtual plane.

8. (Previously Presented) The in-line four-cylinder engine for a vehicle according to claim 5, wherein balance ratios  $k_L$  and  $k_R$  and distances  $D_L$  and  $D_R$  of half crank webs of the respective cylinders are symmetrical between the first and fourth cylinders and symmetrical between the second and third cylinders.

9. (Previously Presented) The in-line four-cylinder engine for a vehicle according to claim 6 or 7, wherein the distances  $D_L$  and  $D_R$  are symmetrical between the first and fourth cylinders and between the second and third cylinders while the balance ratios  $k_L$  and  $k_R$  of half crank webs are symmetrical between two arbitrary combined cylinders.

10. (Previously Presented) The in-line four-cylinder engine in claim 1, wherein the primary balancer is provided parallel to the crankshaft, and balance weight is provided at a location opposite to the crank pins of the second and third cylinders or at a location opposite to the crank pins of the first and fourth cylinders.

11. (Previously Presented) A vehicle provided with the in-line four-cylinder engine for a vehicle according to claim 1.

12. (New) The in-line four-cylinder engine in claim 1, wherein the primary balancer shaft is the only balancer shaft.

13. (New) The in-line four-cylinder engine in claim 1, wherein each of  $k_L$  and  $k_R$  are defined by the formula  $k = (M - W_{rot} * r / 4) / (W_{rec} * r)$ , and further wherein

M denotes total unbalance quantity of a corresponding half crank web (whose unit is the moment g\*mm),

$W_{rot}$  denotes mass for a rotating portion,

$W_{rec}$  denotes mass for a reciprocating portion, and

r denotes the rotational radius of  $W_{rot}$  and  $W_{rec}$ .